UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5

MEMORANDUM

DATE: August 26, 2009
SUBJECT: Determination of Need for an Investigation
Facility Name: Richland Moulded Brick Company
EPA ID #: OHR 000 011 221

FROM: Erin K. Jones
Erin K. Jones, Environmental Protection Specialist

TO: George Hamper, Chief, Corrective Action Section 2

I recommend the following determination regarding the need for an investigation:

☒ **CA070NO** Determination of Need for an Investigation-Investigation is not Necessary

Reason for Determination

- ☐ Preliminary Assessment/Visual Site Inspection (PA/VSI) did not recommend any further investigation
- ☐ PA/VSI recommendations do not warrant RRB attention
- ☐ Phase 1 Environmental Site Assessment (ESA) did not recommend further investigation
- ☐ Phase 2 ESA did not recommend further investigation
- ☐ Phase 1/Phase 2 ESA recommendations do not warrant RRB attention
- ☒ Company representative asserts that the site is clean
- ☐ Not subject to corrective action
- ☐ Enrolled in other clean-up program
- ☐ PA/VSI recommendations have been implemented
- ☐ Removal
- ☐ Enrolled Voluntary Remediation Program
- ☐ Completed Voluntary Remediation Program
- ☐ Superfund
- ☐ Superfund No Further Action Decision
- ☐ Superfund Base Relocation and Closure
- ☐ Other _____

☐ **CA070YE** Determination of Need for an Investigation – Investigation is Necessary

Reason for Determination

- ☐ PA/VSI recommends further investigation
- ☐ ESA recommends further investigation
- ☐ Other _____

☐ **No determination can be made** – More Information Needed

☒ Approved ☐ Not Approved

Signed: George Hamper Date: SEP 30 2009

Determination Date: August 26, 2009
Determination: Company representative asserts that the site is clean

Facility Contact Form (No PA/VSI)

Facility Name:___Richland Moulded Brick Company_

EPA ID#:_ OHR 000 011 221____ Address: _ 1000 Richland Shale Road_____

City:____Mansfield _____ State:__ OH____

Units Closed:_____ S01_____ Date:____ 10/5/2006_____

Facility Representative:____ Scott Frame_____ Phone#__256-237-2887___

Email Address:_____

Date of phone conversation:_____ August 26, 2009_____

On August 19, 2009 I spoke with Bill Geier who works for the company at the facility in Mansfield. On August 26, 2009 I spoke with Scott Frame the company owner.

The contaminated area that was cleaned during closure was contaminated with hexavalent chromium. This was produced as a result of the operation of the electric arc furnace dust.

This facility is not a generator of hazardous waste; however, Bill Geier referred to some non hazardous dumping that has occurred on the property including 600 tires that were found on the property in June 2009.

Herman Stein at the Ohio Department of Development is currently looking for grant money so the facility can do a Brownfields Clean-up.

Y / N Is there known soil or groundwater contamination?
Contaminants:

Y / N Has the parcel been split or was there a change in ownership?
The Frame family purchased the property in October 1988. More recently, they sold part of the property but not all of it.
Y / N / N Was a Phase 1 or Phase 2 report prepared in connection with a sale of the property?
Y / N Can we have a copy?
Scott does not know if a Phase 1 or 2 was completed by the purchaser in the recent property transaction.
Y / N Is the facility currently operating?
This facility has not operated since 2006.

- When was the plant built? The original building was built in 1910. The plant that they bought was built in 1968.

What products are/were made?

Bricks and perhaps some tile. All shale is dug up there and mixed with water and reformed to make bricks.

- What chemicals were used in the process?
  -Ingredients: Shale and water

  -Solvents for cleaning products: No

  -Solvents for degreasing machinery: No

  -Fuels (coal/gasoline/fuel oil): There used to be a #2 diesel fuel tank. It is now empty.

  Y / N Are there any known spills from electrical equipment containing PCBs?
  Y / N Have spills always been cleaned up properly?

- What kinds of solid wastes were produced?

  When the facility was operating it produced now solid waste. The only waste is office trash that goes into a dumpster. One June 24, 2009 the Department of Health found 600 tires that had been dumped on the property in the woods.

- How were solid wastes managed?
  Y / N Waste piles Quantity:_____
  Containing:

  Y / N On-site landfill Quantity:_____
  Containing: There was a C& D landfill at Plant 1. However, this is the site of Plant 2, so not at this facility.

- How were liquid wastes (such as solvents) managed?
  Y / N Drums
  Containing: 30 drums of hydraulic oil, trying to ship off site. Disposal facility got in a lot of trouble and trying to find a place to take them now. These were supposed to get shipped to Hugel Chemical in Bedford, OH but Hugel is in major violation.
  Y / N Above-ground tanks Quantity:_1_____
  Containing: Empty #2 diesel fuel tank
  Y / N Underground tanks Quantity:_____ How long have they been in use?_____
  What are they made out of: Steel / Cement / Other:_____
  Any known leaks: No

  Y / N Underground pipes
  Containing:

- How were wastewaters managed?
  Y / N Tanks
  Y / N Pits, ponds, or lagoons (surface impoundments)

OhioEPA
State of Ohio Environmental Protection Agency
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Ted Strickland, Governor
Lee Fisher, Lieutenant Governor
Chris Korleski, Director

June 8, 2007

Mr. Scott W. Frame, P.E.
Vice President
Richland Moulded Brick Company, Inc.
705 Quintard Avenue
P.O. Box 754
Anniston, Alabama 36202

Re: Final Closure Letter
Risk Assessment
Richland Moulded Brick
OHR000011221

Dear Mr. Frame:

On May 27, 2005, Ohio EPA approved the closure plan for Richland Moulded Brick's (RMB) hazardous waste facility located at 1000 Richland Shale Road, Mansfield, Ohio 44901.

On June 29, 2006, the director received final closure certification documents from The Payne Firm, Inc., on behalf of RMB. William C. Geier, Sr. and John L. Payne, P.E. certified that RMB had been closed according to the specifications in the approved closure plan. The type of closure was an unrestricted closure by removal and demonstration of successful decontamination to below health-based standards through a risk assessment. A Notice of Deficiency (NOD) letter was sent to RMB on September 11, 2006, stating that additional information was needed to support the certification report. On April 14, 2007, May 15 and 17, 2007, RMB submitted responses and documentation to address the deficiencies in the certification report. Ohio EPA has reviewed the documentation provided by RMB and has determined that the comments in the NOD letter have been addressed to the Agency's satisfaction.

To verify RMB's closure activities, Dawn Pleiman from Ohio EPA's Northwest District Office, conducted a final inspection of RMB on October 5, 2006. She also reviewed documents pertaining to the closure of the facility and determined that the activities proposed in the closure plan were conducted adequately.

Based on this inspection and review, Ohio EPA has determined that RMB has closed the electric arc furnace (EAF) dust (K061) hazardous waste storage units according to the approved closure plan and Ohio Administrative Code (OAC) rules 3745-66-11 through 3745-66-15.

The facility's compliance with closure obligations under Ohio's hazardous waste laws does not discharge RMB's obligation to investigate and possibly clean up contamination from releases of hazardous waste or hazardous constituents at the facility, regardless of when the waste was placed in the unit. This requirement is known as RCRA Corrective Action.

RMB has completed final closure at the facility. However RMB remains out of compliance with OAC rule 3745-52-11, for failure to evaluate waste consisting of miscellaneous drums, buckets and containers of unknown material that were left on the property. RMB is reminded of its responsibility to address Ohio EPA's November 15, 2006, Notice of Violation letter regarding the abandoned wastes that were discovered during the closure certification inspection.

If you have any questions concerning the closure process or the status of the facility, please contact Dawn Pleiman by phone at (419) 373-3148, or by mailing address at Ohio EPA, Northwest District Office, Attn: Dawn Pleiman, 347 North Dunbridge Road, Bowling Green, OH, 43402.

Sincerely,

Michael Terpinski
Supervisor
Division of Hazardous Waste Management

/llr

pc: David Sholtis, Assistant Chief, DHWM
Ed Lim, Manager, ERAS, DHWM
Harry Sarvis, Manager, CAS, DHWM
Dale Meyer, Region V, U.S. EPA
DHWM, NWDO File: Richland Moulded Brick

ec: Jeremy Carroll, Supervisor, Engineering Unit, DHWM, CO
Michael Terpinski, DHWM, NWDO
John Pasquarette, DHWM, NWDO
Dawn Pleiman, DHWM, NWDO
Kara Reynolds, DHWM, NWDO

A-4-1

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Joseph P. Koncelik, Director

MAY 27 2005

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Mr. Scott W. Frame, P.E.
Vice President
Richland Moulded Brick Company, Inc.
705 Quintard Avenue
P.O. Box 754
Anniston, Alabama 36202

Re: Closure Plan Approval with Modifications
Richland Moulded Brick
Richland County
OHR 000011221

Dear Mr. Frame:

On December 26, 2003, Richland Moulded Brick (RMB) submitted to Ohio EPA a closure plan for the electric arc furnace (EAF) dust (K061) hazardous waste storage units located at 1000 Richland Shale Road, Mansfield, Ohio. Revisions to the closure plan were received on February 1, 2005. The closure plan was submitted pursuant to rule 3745-66-12 of the Ohio Administrative Code (OAC) in order to demonstrate that Richland Moulded Brick's proposal for closure complies with the requirements of OAC rules 3745-66-11 and 3745-66-12.

The owner or operator and the public were given the opportunity to submit written comments regarding the closure plan in accordance with the hazardous waste rule requirements. No public comments were received by Ohio EPA.

Based upon review of Richland Moulded Brick's submittal and subsequent revisions, I conclude that the closure plan for the hazardous waste facility at 1000 Richland Shale Road, Mansfield, Ohio, as modified herein, meets the performance standard contained in OAC rule 3745-66-11, and complies with the pertinent parts of OAC rule 3745-66-12. The closure plan submitted to Ohio EPA on December 26, 2003 and revised on January 20, 2005 by Richland Moulded Brick is hereby approved with the following modifications:

I certify this to be a true and accurate copy of the official document as filed in the records of the Ohio Environmental Protection Agency.

By: _____ Date: 5-27-05

1. **Decontamination pad**
Richland Moulded Brick (RMB) has not provided sufficient information regarding the decontamination area. Information that the closure plan currently lacks includes: a map indicating the location of the decontamination area, a description of rinsate containment plans, and decommissioning procedures for the area.

The closure plan is hereby modified to state that RMB will submit additional information on the decontamination pad to include: a map (or an approximate description) of where the decontamination area will be located, rinsate containment plans (berms, etc.) and pad decommissioning and disposal. The information must be submitted at least five days prior to initiating closure activities on-site so that Ohio EPA has sufficient time to review the information.

2. **Migration of rinsate from decontamination activities**
Ohio EPA would like more information on how RMB plans to contain the EAF dust and rinsate generated from decontamination of the screw conveyors and the kiln baghouse. According to the closure plan, "All leachate will be captured and properly disposed of as a K061 waste". Further elaboration on how waste from decontamination activities of the conveyors and baghouse will be kept from migrating from those areas is needed in the closure plan. RMB must submit the additional containment information prior to initiating closure activities at the site.

3. **Conveyors**
After the silo and the screw conveyors are decontaminated, rinsate samples should be obtained from each area. A rinsate sample from the silo is currently part of the closure plan. In addition, Ohio EPA would like another rinsate sample to be collected from the conveyors. The closure plan is hereby modified to include an additional rinsate sample to be collected from one of the conveyors and compared to the rinsate standard detailed in the CPRG.

4. **Volume of waste removed from silo**
RMB states that it currently has an inventory of 2,350 cubic yards (cy) of calcine and that the value is the maximum quantity in inventory at the time of closure but waste from the storage silo was removed in September of 2003. Ohio EPA needs clarification on what was the maximum volume of EAF dust waste ever on site; if it was 2,350 cy minus what was shipped off site from the storage silo or if the 2,350 cy value represents the current volume of waste after the silo waste was shipped off site. In addition, RMB must be able to provide documentation proving that all waste, both hazardous and non-hazardous, and associated debris, rinsate and decontamination material are transported and delivered to appropriate disposal facilities.

RMB must also be able to provide documentation proving that a licensed hazardous waste transporter was used to transfer the hazardous waste. Supporting documentation must be included in the closure certification report.

5. **Potential for ground water contamination**
RMB has not provided sufficient information regarding the calcine stockpiles and what will be done in the event that the waste is found to have been in contact with soil. Preparation and approval of a soil sampling grid and contingency plan prior to initiating closure activities would avoid unnecessary delays and RMB from having to submit an amendment to the closure plan. The full extent of potential soil or ground water contamination can be determined through a soil sampling plan similar to the one provided in the December 23, 2003 closure plan from RMB.

In addition, if observations of the floor indicate potential waste migration, RMB must provide supporting documentation that defends its contention that a ground water investigation of the site is unnecessary, i.e., a discussion of the site geology from the operation of the shale quarry on the property. Documentation should include an evaluation of the presence or absence of any shallow perched sand and gravel zones in the glacial till above the shale bedrock.

Compliance with the approved closure plan, including the modifications specified herein, is expected. Ohio EPA will monitor such compliance. Ohio EPA expressly reserves the right to take action, pursuant to chapters 3734. and 6111. of the Ohio Revised Code, and other applicable law, to enforce such compliance and to seek appropriate remedies in the event of noncompliance with the provisions and modifications of this Approved Closure Plan. Please be advised that approval of this closure plan does not release Richland Moulded Brick from any responsibilities regarding corrective action for all releases of hazardous waste or constituents from any waste management unit, regardless of the time at which waste was placed in the unit.

You are hereby notified that this action of the Director of Environmental Protection is final and may be appealed to the Environmental Review Appeals Commission pursuant to Ohio Revised Code section 3745.04. The appeal must be in writing and set forth the action complained of and the grounds upon which the appeal is based. The appeal must be filed with the commission within 30 days after notice of the Director's action. Notice of the filing of the appeal shall be filed with the Director within three days after the appeal is filed with the commission. An appeal may be filed with the commission at the following address:

Environmental Review Appeals Commission
309 South Fourth Street
Room 222
Columbus, Ohio 43215

When closure is completed, OAC rule 3745-66-15 requires the owner or operator of a facility to submit to the Director of Ohio EPA, certification by the owner or operator and an independent, registered professional engineer, that the facility has been closed in accordance with the approved closure plan. The certification by the owner or operator shall include the statement found in OAC rule 3745-50-42(D). These certifications should be submitted to: Ohio Environmental Protection Agency, Division of Hazardous Waste Management, Attn: Pamela Allen, Regulatory and Information Services Section, P.O. Box 1049, Columbus, Ohio 43216-1049.

Ohio EPA, Division of Hazardous Waste Management strongly encourages you to consider pollution prevention options for any processes at your facility that generate waste. While implementation of pollution prevention options is not required by Ohio laws and regulations, the application of waste minimization practices may help reduce the expense of remedial activities. Additionally, implementation of pollution prevention options may prevent the creation of new units and as a result eliminate the requirement to submit a closure plan in the future. For assistance in identifying and implementing pollution prevention options, contact Colleen Weaver at (419) 373-3059.

Sincerely,

Joseph P. Koncelik
Director

/lb

pc: Pamela Allen, DHWM Central File, Ohio EPA
Ed Lim, Manager, ERAS, CO, Ohio EPA
Harriet Croke, U.S. EPA - Region V
DHWM-NWDO File, RMB: General

ec:
Jim Kavalec, DHWM, CO
Frances Kovac, Legal, CO, Ohio EPA
Michael Terpinski, DHWM-NWDO
John Pasquarette, DHWM-NWDO
Dale McLane, DDAGW, NWDO
Dawn Pleiman, DHWM-NWDO
Amy Heller, DHWM-NWDO

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State of Ohio Environmental Protection Agency

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MAILING ADDRESS:
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Columbus, OH 43216-1049

MAR - 9 2006

Mr. Scott W. Frame, P.E.
Vice President
Richland Moulded Brick Company, Inc.
705 Quintard Avenue
P.O. Box 754
Anniston, Alabama 36202

Re: Closure Period Extension
Richland Moulded Brick
Richland County
OHR 000011221

Dear Mr. Frame:

On February 6, 2006, Richland Moulded Brick, located at 1000 Richland Shale Road, Mansfield, Ohio, submitted a request for an extension to the closure period specified in the approved closure plan dated May 27, 2005, for 69 days, until May 1, 2006. The extension request was submitted pursuant to Ohio Administrative Code (OAC) rule 3745-66-13(B), as closure will require longer than the 180 day period specified in OAC rule 3745-66-13. Richland Moulded Brick has requested this extension because high levels of lead were found beneath the former Eastern Calcine Pile. Further delineation and excavation is now necessary to ensure that impacted soils can be removed from the site in accordance with the closure performance standard.

My staff reviewed your request for an extension to the closure period, and recommends that the extension be granted per OAC rule 3745-66-13(B). I concur, and am therefore granting this extension request. This extension is being granted for the above referenced closure plan and expires on May 1, 2006.

Richland Moulded Brick shall continue to take all steps to prevent a threat to human health and the environment from the unclosed, but inactive waste management unit per OAC rule 3745-66-13(B)(2).

Please be advised that approval of this closure extension request does not release Richland Moulded Brick from any responsibilities as required under the Hazardous and Solid Waste Amendments of 1984, regarding corrective action for all releases of hazardous waste or constituents from any solid waste management unit, regardless of the time at which waste was placed in the unit.

You are hereby notified that this action of the Director of Environmental Protection is final and may be appealed to the Environmental Review Appeals Commission pursuant to Ohio Revised Code section 3745.04. The appeal must be in writing and set forth the action complained of and the grounds upon which the appeal is based. The appeal must be filed with the commission within 30 days after notice of the Director's action. Notice of the filing of the appeal shall be filed with the Director within three days after the appeal is filed with the commission. An appeal may be filed with the commission at the following address:

Environmental Review Appeals Commission
309 South Fourth Street
Room 222
Columbus, Ohio 43215

When closure is completed, OAC rule 3745-66-15 requires the owner or operator of a facility to submit to the Director of Ohio EPA, certification by the owner or operator and an independent, registered professional engineer that the facility has been closed in accordance with the specifications in the approved closure plan. The certification shall follow the format specified in OAC rule 3745-50-42(D), and should be submitted to: Ohio Environmental Protection Agency, Division of Hazardous Waste Management, Attn: Pamela Allen, Regulatory and Information Services Section, P.O. Box 1049, Columbus, Ohio 43216-1049.

Sincerely,

Joseph P. Koncelik
Director

/lb
pc: Pamela Allen, DHWM Central File, Ohio EPA
Harriet Croke, Ohio Permit Section, U.S. EPA - Region V
Ed Lim, Manager, ERAS, CO, Ohio EPA
David C. Strayer, The Payne Firm, Inc.
DHWM-NWDO File, RMB: General

ec: Michael Terpinski, DHWM-NWDO
John Pasquarette, DHWM-NWDO
Ed Pulido, DHWM-NWDO
Dawn Pleiman, DHWM-NWDO

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CERTIFIED MAIL

Mr. Scott W. Frame, P.E.
Vice President
Richland Moulded Brick Company, Inc.
705 Quintard Avenue
P.O. Box 754
Anniston, Alabama 36202

I certify this to be a true and accurate copy of the official document as filed in the records of the Ohio Environmental Protection Agency
By _____ Date 11-22-05

Re: **Closure Period Extension**
Richland Moulded Brick
Richland County
OHR 000011221

Dear Mr. Frame:

On October 27, 2005, The Payne Firm, Inc., on behalf of Richland Moulded Brick Company, submitted a request for a 90 day extension to the closure period specified in the approved closure plan that was approved on May 27, 2005. The closure plan was for the clean-up of electric arc furnace dust (K061) contaminated brick at its facility located at 1000 Richland Shale Road, Mansfield, Ohio. The extension request was submitted pursuant to Ohio Administrative Code (OAC) rule 3745-66-13(B), as closure will require longer than the 180 day period specified in OAC rule 3745-66-13 and would extend beyond the original expiration date of November 23, 2005. Richland Moulded Brick has requested this extension because of several unanticipated delays that were discovered during closure.

When the closure plan was prepared, one of the storage areas for the contaminated brick was thought to have a concrete floor throughout the building. Upon removal of the contaminated brick, it was discovered that part of the floor was concrete and the other portion of the floor was earthen. To address the potential for leaching, soil sampling of the area is now necessary. In addition, the closure plan detailed how various pieces of equipment would be decontaminated during closure via high-pressure washing. Upon further review during closure, it was determined that the structural integrity of the equipment could not withstand the high-pressure wash. Richland Moulded Brick decided to disassemble the equipment by cutting it into small pieces and then sending the material to a metal recycler/foundry. Both of these unexpected delays have altered the closure schedule such that additional time is necessary to effectively complete closure.

My staff reviewed your request for an extension to the closure period, and recommended that the extension be granted per OAC rule 3745-66-13(B). I concur, and am therefore granting this extension request. This extension is being granted for the above referenced closure plan and expires on February 21, 2006.

Richland Moulded Brick shall continue to take all steps to prevent a threat to human health and the environment from the unclosed, but inactive waste management unit per OAC rule 3745-66-13(B)(2).

Please be advised that approval of this closure extension request does not release Richland Moulded Brick from any responsibilities as required under the Hazardous and Solid Waste Amendments of 1984, regarding corrective action for all releases of hazardous waste or constituents from any solid waste management unit, regardless of the time at which waste was placed in the unit.

You are hereby notified that this action of the Director of Environmental Protection is final and may be appealed to the Environmental Review Appeals Commission pursuant to Ohio Revised Code section 3745.04. The appeal must be in writing and set forth the action complained of and the grounds upon which the appeal is based. The appeal must be filed with the commission within 30 days after notice of the Director's action. Notice of the filing of the appeal shall be filed with the Director within three days after the appeal is filed with the commission. An appeal may be filed with the commission at the following address:

Environmental Review Appeals Commission
309 South Fourth Street
Room 222
Columbus, Ohio 43215

When closure is completed, OAC rule 3745-66-15 requires the owner or operator of a facility to submit to the Director of Ohio EPA, certification by the owner or operator and an independent, registered professional engineer that the facility has been closed in accordance with the specifications in the approved closure plan.

The certification shall follow the format specified in OAC rule 3745-50-42(D), and should be submitted to: Ohio Environmental Protection Agency, Division of Hazardous Waste Management, Attn: Pamela Allen, Regulatory and Information Services Section, P.O. Box 1049, Columbus, Ohio 43216-1049.

Sincerely,

Joseph P. Koncelik
Director

pc: Pamela Allen, DHWM Central File, Ohio EPA
Harriet Croke, Ohio Permit Section, U.S. EPA - Region 5
Ed Lim, Manager, ERAS, CO, Ohio EPA
DHWM-NWDO File, RMB: General
ec: Michael Terpinski, DHWM-NWDO
John Pasquarette, DHWM-NWDO
Ed Pulido, DHWM-NWDO
Dawn Pleiman, DHWM-NWDO

JPK/llr

OhioEPA
State of Ohio Environmental Protection Agency

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Bob Taft, Governor
Bruce Johnson, Lieutenant Governor
Joseph P. Koncelik, Director

September 11, 2006

Mr. Scott W. Frame, P.E.
Vice President
Richland Moulded Brick Company, Inc.
705 Quintard Avenue
P.O. Box 754
Anniston, Alabama 36202

Re: Notice of Deficiency
Closure Certification Report
Richland Moulded Brick Company
OHR000011221

Dear Mr. Frame:

On June 29, 2006, Ohio EPA received a closure certification report from Richland Moulded Brick located at 1000 Richland Shale Road, Mansfield, Ohio. The certification report was for six hazardous waste storage units contaminated with electric arc furnace (EAF) dust (K061). There were four container storage areas which include: a baghouse, a storage silo with three conveyors, a former "Super Sack" storage area, and a current "Super Sack" storage area. The other two units were waste piles.

Ohio EPA, Division of Hazardous Waste Management (DHWM) has conducted a review of the above referenced closure certification, and has determined it to be incomplete and technically inadequate.

The following comments reflect Ohio EPA's findings and elaborate on the deficiencies found with the closure certification report. Please provide a revised closure certification report addressing all areas indicated in the deficiency comments within thirty (30) days of the receipt of this letter.

Comments

1. Total volume of waste disposed
   The closure certification report says that 1,360 cubic yards (yd^3) of K061 waste was sent for disposal and that 120 yd^3 of structural steel sent for recycling and reuse as a result of remediation activities. Manifests in the certification amounted to a total of 1,364 yd^3 of K061 waste sent to Envirosafe Services of Ohio for disposal.

This final volume differs significantly from what the closure plan estimated. RMB's closure plan estimated that ~2,350 yd^3 of K061 waste would be disposed during closure: an estimated 1,100 yd^3 of calcine from the Western Calcine Stockpile and an estimated 1,250 yd^3 of calcine from the Eastern Calcine Stockpile. During closure, RMB determined that part of the Eastern Calcine Stockpile was underlain by soil and not concrete which necessitated minor modifications to the approved closure plan. Several rounds of soil sampling occurred resulting in soil removal activities.

Ohio EPA would like an explanation for the discrepancy in the amount of hazardous waste removed from the site. Since the floor area underlying the Eastern Calcine Stockpile was more problematic than anticipated and deviated from the closure plan, more waste would have been expected, not less. If manifests were omitted, they must be included in the revised certification report. All (hazardous) waste(s) generated and removed from the site must be accounted for in the certification report. RMB is reminded that copies of the manifests must show that the wastes were received by a TSD facility. Therefore, TSD signatures must be on all manifests or shipping papers.

2. Disposal of structural steel

In the closure plan, RMB planned to decontaminate the storage silo and baghouse by pressure washing or aggregate blasting, or hand washing followed by rinsate sampling. Once remediation activities began, it was determined that due to the poor structural integrity of the structures, the walls of the units were too corroded to withstand either high-pressure washing or aggregate blasting. In a letter to Ohio EPA dated October 24, 2005, RMB submitted a request for a few minor modifications to the approved closure plan. One of the modifications was to disassemble the silo and baghouse and cut the K061-contaminated steel into small pieces and ship the waste off-site for reuse/recycling at a foundry. Ohio EPA approved this minor modification and the two units were cut into pieces. RMB's certification report states that 120 yd^3 of structural steel were sent for recycling and reuse. The certification report does not document that the material was sent for recycling as no manifests, shipping papers or sales agreements were provided documenting such a transaction. RMB must provide the necessary documentation proving that all hazardous wastes were removed and sent to an appropriate disposal and/or recycling facility.

3. Treatment, storage, disposal (TSD) facility signatures

It is the owner's responsibility to ensure that all hazardous wastes are disposed of properly.

The following manifests were not signed by the TSD facility:

- 91831
- 91832 *invoice from disposal facility acknowledges manifest
- 92431 *invoice from disposal facility acknowledges manifest
- 92631 *invoice from disposal facility acknowledges manifest

These manifests are only contained in the approved closure plan. They should also be contained in the certification report. RMB is reminded that copies of the manifests must show that the wastes were received by an appropriate TSD facility. Therefore, TSD signatures must be on all manifests or shipping papers.

The revised closure certification report shall be prepared in accordance with the following editorial protocol or convention:

1) Old Language is over-struck, but not obliterated.

2) New Language is capitalized.

3) Page headers should indicate date of submission.

4) If significant changes are necessary, pages should be re-numbered, table of contents revised, and complete sections provided as required.

The certification should be submitted to: Ohio Environmental Protection Agency, Division of Hazardous Waste Management, Attn: Pamela Allen, Manager, Regulatory and Information Services Section, P.O. Box 1049, Columbus, Ohio 43216-1049. A copy should also be sent to:

Ohio Environmental Protection Agency
Northwest District Office
Attn: Dawn Pleiman
Division of Hazardous Waste Management
347 North Dunbridge Road, Bowling Green, OH, 43402.

Ohio EPA will, pursuant to OAC rule 3745-66-12, review the re-submitted plan and issue a final action approving or modifying the plan. Ohio EPA's final action on the re-submitted plan is appealable to the Environmental Review Appeals Commission.

If you wish to arrange a meeting to discuss your responses to this Notice of Deficiency, please contact Dawn Pleiman at (419) 373-3148.

Sincerely,

Michael Terpinski
Supervisor
Division of Hazardous Waste Management

/csl

cc: Pamela Allen, DHWM, Central File, Ohio EPA
Harriet Croke, U.S. EPA, Region 5
David C. Strayer, The Payne Firm, Inc.
DHWM-NWDO File

ec: Ed Lim, Manager, Engineering & Risk Assessment Section, CO, Ohio EPA
Michael Terpinski, DHWM, NWDO
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Dawn Pleiman, DHWM, NWDO
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OhioEPA
State of Ohio Environmental Protection Agency

Northwest District Office

Jorth Dunbridge Road
Bowling Green, OH 43402-9398

TELE: (419) 352-8461 FAX: (419) 352-8468

Bob Taft, Governor
Christopher Jones, Director

April 12, 2004

CERTIFIED MAIL

Mr. Scott W. Frame, P.E.
Vice President
Richland Moulded Brick Company, Inc.
705 Quintard Avenue
P.O. Box 754
Anniston, Alabama 36202

Re: Notice of Deficiency
Closure Plan
Richland Moulded Brick
Richland County
OHR 000011221

Dear Mr. Frame:

On December 26, 2003, Ohio EPA received from Richland Moulded Brick Company (RMB), a closure plan for the electric arc furnace (EAF) dust (K061) hazardous waste storage units located at 1000 Richland Shale Road, Mansfield, Ohio.

Ohio EPA, Division of Hazardous Waste Management (DHWM) has conducted a review of the above referenced closure plan, and has determined it to be incomplete and technically inadequate.

We have enclosed, as an attachment to this correspondence, detailed deficiency comments on the closure plan. Please provide a revised closure plan addressing all areas indicated in the deficiency comments. Ohio Administrative Code (OAC) rules 3745-66-12 and 3745-66-18 requires that such a revised closure plan be submitted to the Director of Ohio EPA for approval within thirty (30) days of the receipt of this letter.

The revised closure plan shall be prepared in accordance with the following editorial protocol or convention:

1) Old Language is over-struck, but not obliterated.
2) New Language is capitalized.
3) Page headers should indicate date of submission.
4) If significant changes are necessary, pages should be re-numbered, table of contents revised, and complete sections provided as required.

The revised closure plan should be submitted to: Ohio Environmental Protection Agency, Division of Hazardous Waste Management, Attn: Pamela Allen, Manager, Regulatory and Information Services Section, P.O. Box 1049, Columbus, Ohio 43216-1049.

A copy should also be sent to: Dawn Pleiman, Ohio EPA, Northwest District Office, 347 North Dunbridge Road, Bowling Green, Ohio 43402.

Ohio EPA will, pursuant to OAC rules 3745-66-12 and 3745-66-18, review the re-submitted plan and issue a final action approving or modifying the plan. Ohio EPA's final action on the re-submitted plan is appealable to the Environmental Review Appeals Commission.

If you wish to arrange a meeting to discuss your responses to this Notice of Deficiency, please contact Dawn Pleiman at (419) 373-3148.

Ohio EPA, DHWM, strongly encourages you to consider pollution prevention options for any processes at your facility that generate waste. While implementation of pollution prevention options is not required by Ohio laws and regulations, the application of waste minimization practices may help reduce the expense of remedial activities. Additionally, implementation of pollution prevention options may prevent the creation of new units and as a result eliminate the requirement to submit a closure plan in the future. For assistance in identifying and implementing pollution prevention options, contact Colleen Weaver at (419) 373-3059.

Sincerely,

Michael Terpinski
Supervisor
Division of Hazardous Waste Management

/llr

pc: Pamela Allen, DHWM, Central File, Ohio EPA
Harriet Croke, U.S. EPA, Region 5
Ed Lim, Manager, Engineering & Risk Assessment Section, CO, Ohio EPA
David C. Strayer, The Payne Firm, Inc.
DHWM-NWDO File, RMB: General

ec: Jim Kavalec, DHWM, CO
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Michael Terpinski, DHWM-NWDO
John Pasquarette, DHWM-NWDO
Dawn Pleiman, DHWM-NWDO
Timothy J. Killeen, DHWM-NWDO

Attachment A
Closure Plan Comments

1. **Deficiency: Identification of Hazardous Waste Units**
Although the closure plan discusses two units to be closed, there are actually three hazardous waste units subject to closure:
   - the calcine storage area in Plant #1
   - the baghouse on the west side of Plant #2, and
   - the storage silo on the east side of Plant #2

   Figure 2 of the closure plan shows that the baghouse and the storage silo are over 400 feet from each other and therefore should be considered two distinct units, not one. The revised closure plan will identify and define the three units which are subject to closure.

2. **Deficiency: Grid Interval Determination**
Determining the sampling grid interval and the number of samples required for a site involves several steps. One of these steps requires the assessment of the site's risk of exposure (ROE). A few of the criteria that must be evaluated to complete a ROE matrix include: adjacent land use (industrial, agricultural, residential, or mixed), control of access to the site, and ground water depth.

   A composite sampling intensity factor (SIF) is used to determine the sampling grid interval for the site and the required number of soil samples to be collected. The composite SIF is derived from the carcinogenic and non-carcinogenic potency (slope factor and reference dose) of the contaminants and the site's ROE.

   In the closure plan, sampling grid intervals were based on a composite SIF of 3 and a heterogeneous distribution of hazardous constituents throughout the site. RMB's closure plan does not provide sufficient information to determine how the composite SIF was determined. Ohio EPA would like further clarification as to the methodology RMB utilized to develop the SIF. The closure plan must be revised to include the calculation sheets that delineate the various steps of the composite SIF calculation and the resulting sample number and grid interval determination.

3. **Deficiency: Sampling and Analysis Plan**
Sampling of the calcine storage area has not been thoroughly outlined in the closure plan. USEPA sampling methodologies, sampling equipment, trip blanks/duplicates, shipment, chain of custody, and quality assurance and quality control (QA/QC) procedures have not been addressed to Ohio EPA's satisfaction. Further instruction on soil sampling and the information that should be included in the sampling and analysis plan (SAP) can be reviewed in section 3.14 of Ohio EPA's Closure Plan Review Guidance (CPRG).

4. **Deficiency: Sample Collection & Preservation**
Another important part of the SAP is citation of the type of analytical testing methods and data reporting procedures that will be used for the closure. It is important to ensure that all methods and procedures are consistent with USEPA Publication SW-846 and the American Society for Testing and Materials (ASTM). RMB must revise the closure plan to include information on sampling methods, sample types and clarify the soil sampling procedures. Section 3.14 of the CPRG lists ten items that an adequate SAP should include.

5. **Deficiency: Waste Characterization**
Although RMB states that the hazardous constituents in its EAF waste are cadmium, chromium and lead, no analytical data was provided in the closure plan justifying this rationale. If the characterization is based upon generator knowledge, this should be stated and explained. RMB will include waste characterization information in the revised closure plan.

6. **Deficiency: Well Logs**
Section 3.3 discusses the soil remediation standard and how it was determined. RMB bases their information on ground water depth and ground characteristics from a well log that is stated to be attached with the closure plan. The two production wells identified at a distance of 0.8 miles from the site are too far away to provide useful subsurface information, however if this is the only information available, RMB should include the log in the closure plan. RMB needs to provide more detail regarding domestic and commercial well usage in the area, along with a discussion of the geology and depth to bedrock. The closure plan should also include an inventory of all private water wells located within a 2,000 foot radius of the site. RMB must include information on the surrounding wells, along with the well log, with the revised closure plan to resolve this deficiency.

7. **Deficiency: Soil Sampling**
In Section 3.2.2, the Calcine Storage Area, of the closure plan, RMB states that "Excavation and testing of the underlying soils will continue until the Soil Remediation Standards are met." This comment is not entirely correct. Sampling must continue until the full extent of soil (and ground water) contamination is adequately defined. For example, Section 3.14 (9) of the CPRG states "...when sampling soils for metals, sampling should continue until 2 consecutive analytical results below the site-specific (or generic) background-based remediation standards are obtained in both, vertical and horizontal directions." RMB must revise the closure plan to state when sampling activities can cease in order to resolve the deficiency.

8. **Deficiency: Potential Exposure To Ground Water**
Section 3.2.2, "Calcine Storage Area" needs to address what will be done if, in the unlikely event, ground water is encountered during excavation and or contamination is observed within three to five feet of the water table. Two scenarios are possible if ground water is encountered during excavation (and or contamination is observed within three to five feet of the water table), the construction worker risk exposure, and the possibility that contaminated water will migrate to a surface water body.

A ground water monitoring system will be required to determine rate, extent, and concentration of contaminants per OAC Rules 3745-65-90 to 94 if the above referenced conditions exist. Once rate, extent, and concentration are fully defined, then a sufficient amount of data will need to be obtained in order to calculate an exposure point concentration to be used in the risk calculations per the two types of risk scenarios described above. The above two risk scenarios assume that the saturated zone will be non-potable. Other risk scenarios will need to be investigated if the saturated zone is potable.

9. **Deficiency: Incorrect Maximum Contaminant Level (MCL)**
The closure plan shows that the MCL for chromium is 0.01 mg/l and actually the correct value is 0.1 mg/l. RMB must revise their closure plan to correct this error and re-calculate the rinseate standard for chromium which is generated from the maximum contaminant level goal (MCLG).

10. **Deficiency: PQL Determination**
Closure plans must clearly define the remediation standard for each contaminant in soil and ground water for clean closure. Ohio EPA is unable to clearly determine how the practical quantitation limit (PQL) was determined for lead. Closure plans must be descriptive enough so that the public would be able to understand the scope of the project. RMB must provide more information on how the PQL was determined for lead in the revised closure plan.

11. **Deficiency: Risk Evaluation**
RMB has not completely stated how carcinogenic and non-carcinogenic risk levels will be determined for the calcine storage area. Since RMB is using risk assessment as their closure methodology, RMB can consider closure complete if the risk goals are not exceeded. A carcinogenic risk of 1×10^{-5} or less and a non-carcinogenic hazard index of 1 or less meets the risk goals established by DHWM.

A discussion of how a risk assessment would be used to determine if the storage area exceeded the risk goals was not presented in the closure plan. Cleanup levels were determined for the chemicals of concern (COCs) through multiple chemical adjustments of the Generic Cleanup Numbers (GCNs). These values however, are not used to determine if a site has met its remediation goal.

The following has been taken from Part II, Appendix D of the CPRG to assist with calculation of risk levels for both cancer and non-cancer of the calcine storage area.

Carcinogenic risk estimate:

$$\text{Risk} = [(conc_x / RCN_x) + (conc_y / RCN_y) + (conc_z / RCN_z)] \times 10^{-5}$$

Non-carcinogenic hazard estimate:

$$\text{Hazard Index (I)} = [(conc_x / RCN_x) + (conc_y / RCN_y) + (conc_z / RCN_z)]$$

conc= concentration term
RCN= risk-based cleanup number (RCN) = GCN= generic cleanup number

The unit-specific concentration term (conc) is obtained by using either the maximum concentration or the 95% upper confidence limit (UCL) of the arithmetic mean. A chemical-specific risk-based cleanup number (RCN) aka GCN, taken from Ohio EPA's *Table 1- Residential Generic Cleanup Numbers*, is divided into the concentration term to determine the individual risk levels. Some chemicals have both a carcinogenic and non-carcinogenic cleanup number, therefore, RMB should use the appropriate values for each calculation. To assist with the revised closure plan, the following table has been provided which contains the appropriate direct contact soil GCNs for this closure. RMB shall include this table in the revised closure plan, determine if the site meets acceptable risk levels by completing a risk assessment, and provide the calculation sheet(s) to document its findings.

Contaminant	Single Chemical Noncancer Direct Contact Soil mg/kg	Single Chemical Cancer Direct Contact Soil mg/kg
Cadmium	31.9	14100
Chromium VI	73.8	2110

RMB is encouraged to refer to Part II Appendix D Sec. 3.3 of the CPRG for more information on conducting a risk evaluation or contact Dawn Pleiman at NWDO for technical assistance.

12. **Deficiency: Decontamination of Equipment**

To ensure that contaminated material is neither transported offsite nor able to contaminate other environmental media, a decontamination area must be prepared that can sufficiently contain rinsates and wastes generated from decontamination activities. Therefore, the closure plan must provide detailed procedures on equipment decontamination and containment of waste generated in that process. Of particular concern is the decontamination of the front end loader. Decontamination activities should be more extensive than merely brushing material from the loader bucket. Decontamination activities should include both physical and chemical extraction methods. The bucket as well as the tires and/or tracks on the front end loader need to be adequately rinsed off. Part I, Section 3.10 of the CPRG mentions chemical extraction methods such as non-phosphate detergent washes and water rinses as possible decontamination options.

All decontamination equipment and waste generated from decontamination must be disposed of properly. RMB's closure plan does not state what wastes will be generated from all of the decontamination activities, how the wastes will be disposed, or provide an estimate of the amount of rinsate that is expected to be generated. If equipment will be reused, such as brushes or sampling equipment, the closure plan should detail the decontamination of these items. RMB must add language to the closure plan to address this deficiency.

13. **Deficiency: Status of the Facility After Closure**
Closure plans should clearly state the status of the hazardous waste facility after closure is complete. RMB has not completely addressed this item and therefore must revise the closure plan to include language regarding the status of the facility after closure. The statement should define the units that were closed under this closure plan and list any remaining hazardous waste storage areas at the facility that are not covered by the submitted closure plan. Further elaboration on this topic can be obtained in Ohio EPA's Closure Plan Review Guidance (CPRG) Part I, Section 3.19.

14. **Deficiency: Incorrect Generic Risk-based Cleanup Number (GCN)**
Cadmium's single chemical Risk-based Cleanup Number (RCN) a.k.a. Generic Cleanup Number (GCN) is stated as 63.8 mg/kg in the closure plan. The correct single chemical GCN for direct contact soil is 31.9 mg/kg. RMB will revise the closure plan table to include the correct GCN value and perform a multiple chemical adjustment on the value to determine the adjusted GCN for this site. The most current GCN table can be found at:
http://www.epa.state.oh.us/dhwm/pdf/GCNTablesFinal.pdf

15. **Deficiency: Notification of Critical Activities**
Ohio EPA must be made aware of when all critical closure activities will be occurring. Although RMB has stated that they will notify Ohio EPA prior to closure activities, Ohio EPA wants to ensure that sufficient notice is provided so that Ohio EPA has the opportunity to observe these activities. Therefore, RMB will revise their closure plan to indicate that Ohio EPA will be notified at least five days in advance of critical closure activities.

16. **Deficiency: Storage Silo Waste**
RMB's closure plan states that the EAF dust that was stored in the silo was removed. The closure plan does not indicate the amount of waste removed, how it was removed, who transported the waste, or where the waste was taken for disposal. All closure and removal activities must be documented in the closure plan so that Ohio EPA can track the transport of hazardous waste and ensure that it was properly containerized, shipped, and disposed in a manner consistent with Ohio's Hazardous Waste Generator Standards as specified in OAC 3745-52. RMB will revise their closure plan to include this information and provide any supporting documentation to add further detail on closure activities.

17. **Deficiency: Description of the Storage Silo**
Ohio EPA is unable to determine the structural characteristics and integrity of the storage silo based upon the closure plan. Questions that need to be addressed in the closure plan include the following:

- structural integrity of the silo - is the silo resting on concrete, dirt, etc.
- rinsate - anticipated amount of rinsate generated from decontamination activities

RMB must adequately address these questions with the revised closure plan to remove this deficiency. Pictures or construction drawings of the unit with an approximate scale and volume are useful.

18. **Area of Concern: Schedule for Closure**
Section 3.7 of the closure plan details the schedule for closure activities and when a professional engineer will be present. RMB is reminded that the Professional Engineer must be licensed, and registered in the state of Ohio. Inclusion of language addressing this item in the closure plan would resolve this concern.

19. **Area of Concern: Site Security**
RMB is reminded to ensure that the closure plan's health and safety plan (HASP) is site-specific and meets Occupational Safety and Health Administration (OSHA) site safety regulations. In particular, items that should be addressed include: monitoring equipment, personal protective clothing and equipment, hazard evaluation, decontamination, and emergency procedures.

20. **Area of Concern: Data Collection and Analysis Performance Review Form (PRF)**
To expedite the closure plan review process, an additional form used for the closure review has been included as an attachment for RMB to complete and return with the revised closure plan. The form is a Data Collection and Analysis Performance Review Form (PRF). Ohio EPA requests that the information and data necessary to complete the form are submitted along with the revised closure plan.

Attachment B
Data Collection & Analysis PRF

Data Collection and Analysis Plan Review Form

12/2001

s Plan Review Form is #		of		forms completed in the review of this closure plan.

Facility Name		Reviewer/DO	
ID Number		Date of Plan	
Date Review of Plan Completed		Plan is: New, Amended, Revised	

Sampling and Analysis Plan		
3.14 General Information About The SAP		**Location in Closure Plan**
A) Does the closure plan clearly state the facility's intention to fully define the nature and extent of contamination?		
B) Does the plan identify all media that are to be sampled? If so, list the types of media:		
C) Does the plan include a list of all parameters that are to be analyzed? If so, list the parameters and state the basis for including each parameter in Table 1 below (e.g., included in the hazardous waste managed at the facility, underlying constituent for listed waste, degradation compound, etc.):		
D) Does the plan identify the correct analytical method for each parameter? If so, list the analytical methods in Table 1 below:		
E) Does the plan include an estimated quantitation limit (EQL) for each parameter? If so, list the EQLs in Table 1 below:		
F) Is the EQL below the risk-based standard (RfD, PRG, etc.)? If so, state "Y" in the last column of Table 1 below:		

Table 1: Sampling Methods and Detection Limits

Parameter	Method	Rationale	EQL (mg/l)	Is EQL < Risk (Y/N)?

Table 1: Sampling Methods and Detection Limits				
Parameter	**Method**	**Rationale**	**EQL (mg/l)**	**Is EQL < Risk (Y/N)?**

3.14.1 Grid Spacing, Number of Samples, and Sampling Data		Location in Closure Plan
A) Did the facility determine the appropriate grid spacing for horizontal sampling? If so, what is the sampling interval? What was the method utilized to determine this?		
B) Did the facility determine the correct number of samples to be taken? If so, what is the number of samples? What was the method utilized to determine this?		
C) Did the plan include a map of the sampling locations? If so, attach a copy to this form or reference the page.		
D) Did the plan identify the interval at which vertical samples will be taken? If so, what is the interval and what is the rationale for this interval?		
E) If a lab has been selected, did the plan include a statement indicating that the lab, doing the analysis, has QA/QC procedures in place that will meet the requirements of a RCRA closure?		
F) What type of samples (grab or composite) did the plan state will be collected?		
G) What type of lab method(s) will be employed to analyze the samples?		
H) Did the plan specify the correct order of collecting samples (VOCs, SVOCs, PCB/pesticides, metals)?		
I) Did the plan specify the appropriate sampling equipment (e.g., hollow stem auger, split spoon, etc.)? If so, list the sampling devices in Table 2 below:		
J) Did the plan include a narrative that describes the sampling procedures, including the type of container and preservative to be used? If so, list the container type and the preservative used in Table 2 below:		

Table 2: Sampling Devices, Containers, & Preservatives				
Parameter	**Media**	**Sampling Devices**	**Container**	**Preservative**

Table 2: Sampling Devices, Containers, & Preservatives				
Parameter	**Media**	**Sampling Devices**	**Container**	**Preservative**

3.14.1 Grid Spacing, Number of Samples, and Sampling Data (cont'd)		**Location in Closure Plan**
K) Did the plan list what information will be included on container labels? If so, list the information: Such information may include: sample number; sample description (i.e., color, volume, matrix, layering); date, time, and place of collection; collector's name; witness; preservative added; and the analysis required.		
L) Did the plan list what information will be included in boring logs? If so, list the information:		
M) Did the plan list what information will be included in field logs? If so, list the information:		
N) Are field QA/QC samples specified (e.g., field & trip blanks, field duplicates & MS/MSD)? If so, list the type of sample and the frequency for each sample:		
O) Did the plan call for field screening of samples? If yes, briefly describe the procedure:		
P) Are chain-of-custody procedures defined in the plan?		
Q) Describe the decontamination procedures specified in the plan? Such description may include control of sample cross-contamination, equipment and cleaning pad decontamination, rinseate management, decontamination protocol, and control of rinseate release.		

3.11.1.1. Site-Specific Background Sampling		**Location in Closure Plan**
R) How many site-specific background samples were proposed to be collected and what was the rationale for the amount as stated in the plan?		

3.11.1.1. Site-Specific Background Sampling		Location in Closure Plan
B) Did the plan include at least 12 different sampling locations? Attach the map showing those locations:		
C) If so, are the locations in an area of native soil with the same soil horizon as the site soil?		
D) Are these locations away from roadsides, parking lots, spill areas, etc. that may affect the background concentrations?		
E) Did the plan indicate that a data outlier evaluation will be performed on the background sampling data? If so, which method did the plan propose to use?		
F) Did the plan indicate that a data normality evaluation will be performed on the background sampling data? If so, which method did the plan propose to use?		
G) What method did the plan indicate to be used for determination of a background remediation standard for each metal in each soil strata (i.e., mean plus two standard deviations)?		

3.11.1.2. Alternative Remediation Standards		Location in Closure Plan
A) Did the plan propose to use the generic remediation standards (GRS) for metals as shown in CPRG Part 1, Section 3.11.1.2?		
B) Did the plan propose to use the generic cleanup numbers (GCNs) for select metals and VOCs as shown in CPRG Part 2, Appendix D, Table 1?		
C) If the plan did not propose to use either the GRS or GCNs, VOCs must be remediated to non-detect levels and metals must be remediated to site-specific background conditions. For metals, the following section (3.12.2) must be completed when background sampling results are received. If the site will be remediated to risk-based concentrations, the risk assessment plan review form must be completed.		

Statistical Analysis of Sampling Data

3.12.2 Statistical Analysis of Background Soil Samples		Location in Closure Plan
A) Have a minimum of 12 site-specific background samples been obtained for each metal constituent in each soil stratum? If not, how many additional samples are needed?		
B) Of the background samples, how many were deemed unusable due to a preliminary screening of the background data set?		
C) What was the reason for the dismissal (e.g., samples near roadway or contaminated area, lab error, samples from the wrong soil horizon, etc.)?		
D) Was the laboratory EQL clearly stated and consistent for each constituent?		
E) Describe, in Table 3 below, the number and percent of non-detect samples and the EQL for each constituent in each soil stratum. Also, describe how the non-detect samples were incorporated into the data set.		

Table 3: Incorporation of Non-Detect Background Samples into Data Set

Total # of Samples	Type of Metal	Soil Stratum	EQL (ppm)	# of Non-Detect Samples	% of Non-Detect Samples	How were the non-detect samples incorporated into the data set?

3.12.2 Statistical Analysis of Background Soil Samples (cont'd)		Location in Closure Plan
F) Did the plan include a test for determining normality? Complete Table 4 below.		
1) If yes, which method was used (e.g., Shapiro-Wilk, Kolmogorov-Smirnov)?		
2) What type of graphs were included (e.g., Normal Probability Plot, Box and Whiskers Plot)?		
3) Was the data set found to be normally distributed? Answer in Table 4 below.		
G) Did the plan include a test for determining outlier values in the data set?		

3.12.2 Statistical Analysis of Background Soil Samples (cont'd)		Location in Closure Plan
1) If so, indicate the number of outlier values were found?		
2) What was done with those outliers? If those were removed, explain why. If not, explain why not.		
H) If the data set was not found to be normally distributed, was the data set transformed?		
1) Was the transformed data set found to be normally distributed?		
2) Which transformation method was used (e.g., ln(x), $\log_{10}(x)$, square root)?		

Table 4: Box Plot Analysis of Background Sampling Data

Type of Metal	Soil Stratum	Normally Distributed (Y/N)?	Lower Quartile (Q_1)	Upper Quartile (Q_3)	IQR Q_3-Q_1	Lower Cut-Off Q_1-1.5*IQR	Upper Cut-Off Q_3+1.5*IQR	# of Outlier Values

3.12.2 Statistical Analysis of Background Soil Samples (cont'd)		Location in Closure Plan
I) Did the plan include a test for normality after outlier values were removed?		
1) If yes, which method was used (e.g., Shapiro-Wilk, Kolmogorov-Smirnov)?		
2) What type of graphs were included (e.g., Normal Probability Plot, Box and Whiskers Plot)?		
3) Was the data set found to be normally distributed? List in Table 5 below.		
J) If the data set, with the removed outlier values, was not found to be normally distributed, was the data set transformed?		
1) Was the transformed data set found to be normally distributed?		
2) Which transformation method was used (e.g., ln(x), $\log_{10}(x)$, square root)?		

3.12.2 Statistical Analysis of Background Soil Samples (cont'd)		Location in Closure Plan
K) Was the sum of the mean and two standard deviations of the background data set used to calculate a background remediation standard (BRS) for each metal in each soil stratum?		
1) If so, was the mean calculated correctly for each metal in each soil stratum? If not, explain what was incorrect.		
2) If so, was the standard deviation calculated correctly for each metal in each soil stratum? If not, explain what was incorrect.		

Table 5: BRS Calculation Using Background Sampling Data

Type of Metal	Soil Stratum	Method to Transform Data Set	Normally Distributed (Y/N)?	Mean (ppm) (U_b)	Standard Deviation (S_b)	BRS (ppm) $U_b + 2S_b$

3.12.3 Statistical Analysis of Confirmation Soil Samples		Location in Closure Plan
A) Have confirmation soil samples been obtained for each constituent in each soil stratum? If so, complete Table 6 below?		
B) Was the laboratory EQL clearly stated and consistent for each constituent?		
C) Describe, in Table 6 below, the number and percent of non-detect samples and the EQL for each constituent in each soil stratum. Also, describe how the non-detect samples were incorporated into the data set.		

Table 6: Incorporation of Non-Detect Confirmatory Samples into Data Set						
otal # of Samples	Type of Metal	Soil Stratum	EQL (ppm)	# of Non-Detect Samples	% of Non-Detect Samples	How were the non-detect samples incorporated into the data set?

3.12.3 Statistical Analysis of Confirmation Soil Samples (cont'd)		Location in Closure Plan
D) Did the plan include a test for determining normality? Complete Table 7 below.		
1) If yes, which method was used (e.g., Shapiro-Wilk, Kolmogorov-Smirnov)?		
2) What type of graphs were included (e.g., Normal Probability Plot, Box and Whiskers Plot)?		
3) Was the data set found to be normally distributed? Answer in Table 7 below.		
E) Did the plan include a test for determining outlier values in the data set?		
1) If so, indicate the number of outlier values were found?		
2) What was done with those outliers? If those were removed, explain why. If not, explain why not.		
F) If the data set was not found to be normally distributed, was the data set transformed?		
1) Was the transformed data set found to be normally distributed?		
2) Which transformation method was used (e.g., ln(x), $\log_{10}(x)$, square root)?		

Table 7: Box Plot Analysis of Confirmatory Sampling Data								
Type of Metal	Soil Stratum	Normally Distributed (Y/N)?	Lower Quartile (Q_1)	Upper Quartile (Q_3)	IQR Q_3-Q_1	Lower Cut-Off Q_1-1.5*IQR	Upper Cut-Off Q_3+1.5*IQR	# of Outlier Values

Table 7: Box Plot Analysis of Confirmatory Sampling Data								
Type of Metal	**Soil Stratum**	**Normally Distributed (Y/N)?**	**Lower Quartile (Q_1)**	**Upper Quartile (Q_3)**	**IQR Q_3-Q_1**	**Lower Cut-Off Q_1-1.5*IQR**	**Upper Cut-Off Q_3+1.5*IQR**	**# of Outlier Values**

3.12.3 Statistical Analysis of Confirmation Soil Samples (cont'd)		**Location in Closure Plan**
G) Did the plan include a test for normality after outlier values were removed?		
1) If yes, which method was used (e.g., Shapiro-Wilk, Kolmogorov-Smirnov)?		
2) What type of graphs were included (e.g., Normal Probability Plot, Box and Whiskers Plot)?		
3) Was the data set found to be normally distributed?		
H) If the data set, with the removed outlier values, was not found to be normally distributed, was the data set transformed?		
1) Was the transformed data set found to be normally distributed?		
2) Which transformation method was used (e.g., ln(x), $\log_{10}$(x), square root)?		

3.12.3 Comparison of Background & Confirmation Soil Sampling Data		**Location in Closure Plan**
If both data sets are found to be normally distributed, the soil stratum can be declared remediated for a constituent when the 95 percent UCL for the mean of the confirmation data is significantly less than the BRS. Was a T-test performed to prove this? If the background and confirmation data sets are normally distributed, Table 8 below should be completed to verify that the site was remediated for those metal constituents.		
1) Was the T-test performed properly (as shown in CPRG Part 1, Section 3.12.7)?		
2) List the T-test results in Table 8 below.		
3) If a T-test was not performed, was a test for non-parametric data analysis performed on the data set?		
If so, which method was used (e.g., Wilcoxon Rank-Sum Test)?		

3.12.3 Comparison of Background & Confirmation Soil Sampling Data		Location in Closure Plan
5) What was the result of the non-parametric data analysis?		

Table 8: Comparison of Confirmatory Sampling Data to the BRS

Type of Metal	Soil Stratum	Number of Samples (m)	Mean (ppm) (Y_b)	Standard Deviation (S_y)	95% t-dist. (t_{m-1})	95% UCL = ($Y_b + t_{m-1}$) x $S_y/m^{0.5}$	BRS (ppm)	Is 95% UCL < BRS?